4.2.3 Load Type:

Purpose: To select load type

☞ **FEAMAC Note:** ***Only LCON is required for FEAMAC, LOP, and LSS are Ignored by FEAMAC.***

✻LOAD
LCON*=nsel* LOP*=lop* LSS*=iopt*

%

Where

nsel:
1 = Thermal Load
2 = Mechanical Load
3 = Thermomechanical Load

lop: (for 2-D and 3-D GMC)
1 = axial load in 1-direction
2 = axial load in 2-direction
3 = axial load in 3-direction
4 = shear load 23-direction
5 = shear load 13-direction
6 = shear load 12-direction
99 = generalized loading in potentially all 6 directions

For 2-D GMC:
7 = axial loads in 1 and 2 directions
8 = axial loads in 2 and 3 directions
9 = axial load in 1-direction and shear load in 23-direction
10 = axial load in 2-direction and shear load in 13-direction

For 3-D GMC:
7 = axial loads in 1 and 2 directions
8 = axial loads in 2 and 3 directions
9 = axial loads in 1 and 3 directions
10 = axial load in 1-direction and shear load in 23-direction
11 = axial load in 2-direction and shear load in 13-direction
12 = axial load in 3-direction and shear load in 12-direction

iopt:
1 = Strain control
2 = Stress control

☞ **Note:** If lop = 99 one must now enter six iopt values, for example:
LCON= nsel LOP=lop LSS = *iopt1, iopt2, iopt3, iopt4, iopt5, iopt6*

☞ **Note:** see Fig. 6 for the definitions of the directions mentioned above

☞ **Note:** If using laminate option; lop = 1, 2 or 6 are the only valid selections

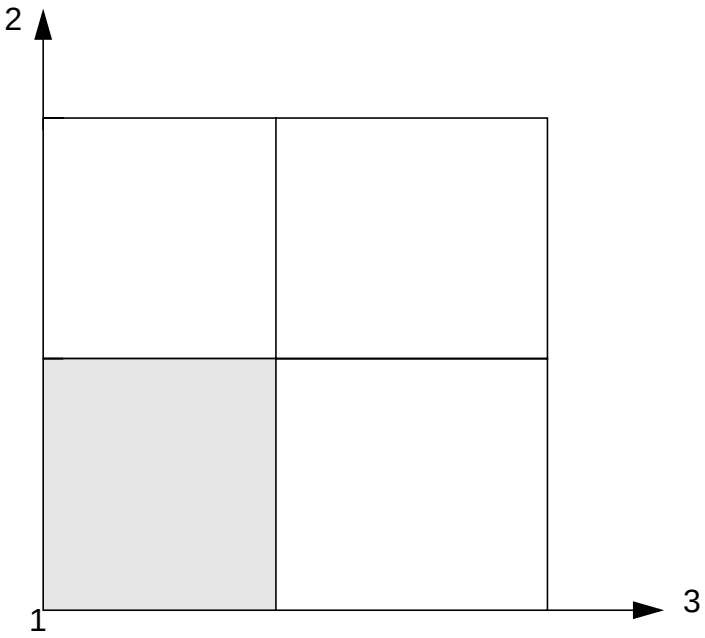
Example: General loading option

⁕LOAD
LCON=1 LOP=99 LSS=2,1,2,2,2,2 %

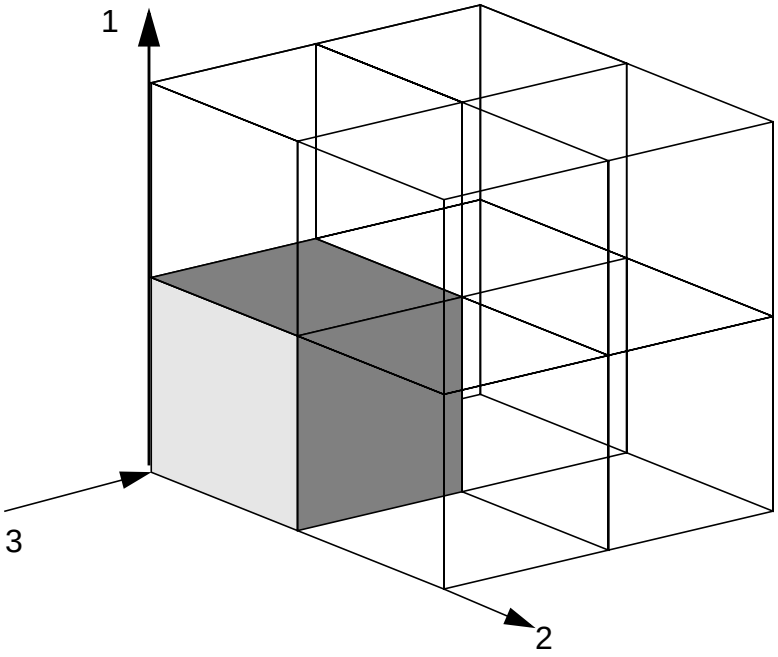
☞ **Note:** This would correspond to specifying mixed stress and strain control, i.e.,**:**

$$\sigma_{11}, \varepsilon_{22}, \sigma_{33}, \tau_{23}, \tau_{31}, \tau_{12}$$

If however, the loads in the **⁕MECH** section were set to 0, 0.01, 0,0,0,0 this would correspond to a pure strain control problem in the 22 direction.



Double Periodicity



Triple Periodicity

Figure 6: Coordinate Systems

4.2.4 Mechanical Load Control:

Purpose: Select type of load control for mechanical load

☞ **Note: This block is only required if LCON = 2 or 3**

☞ **FEAMAC Note:** ***All the data on the MECH card is ignored by FEAMAC***

⁕MECH
NPTW=*nptw* TI=t_1,t_2....t_{nptw} LO= l_1,l_2,....l_{nptw}

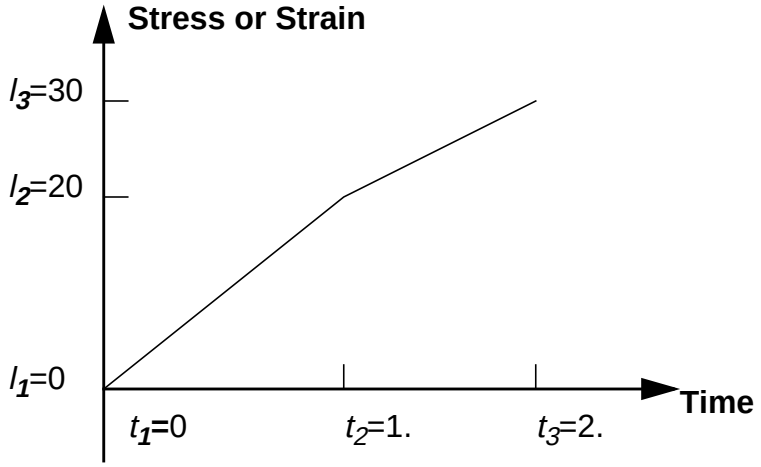
%

Where:

nptw: - number of points on load curve
t_1, t_2, ...t_{nptw} : time values
l_1, l_2, ...l_{nptw} : load curve values

Example:

⁕MECH
NPTW=3 TI=0., 1., 2. LO=0., 20., 30. %



☞ **Note:** For LOP=7,8,...etc (i.e., two load/displacement components) the following format is required **(See Example J** for an example**)**:

⁕MECH

NPTW=2	TI=0., 1.5	LO=0., 0.015	component 1 curve
NPTW=2	TI=0., 1.5	LO=0., 0.01 %	component 2 curve

For LOP=99, six load/displacement components are required.

4.2.5 Temperature Control:

Purpose: Select control for temperature.

☞ **Note: This block is only required if LCON = 1 or 3**

☞ **FEAMAC Note:** ***All the data on the THERM card is ignored by FEAMAC***

⁕THERM
NPTT=*nptt* TI=t_1,t_2....t_{nptw} TE= te_1,te_2,....te_{nptt}

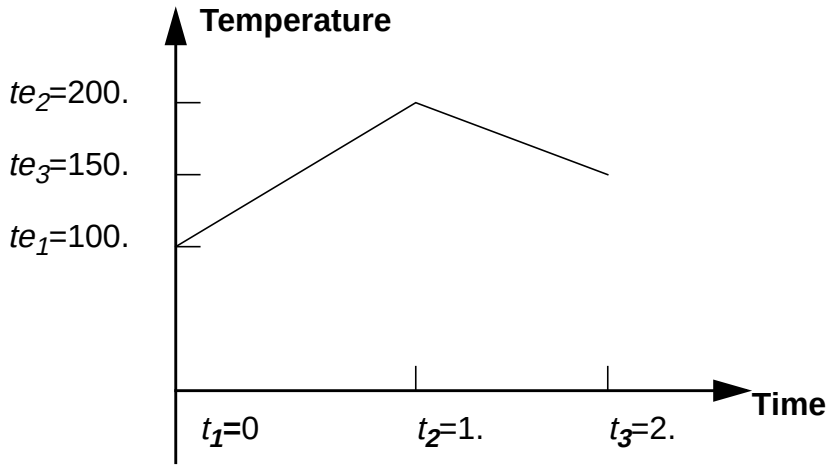
%

Where:

nptt: - number of points on temperature curve
t_1, t_2, ..t_{nptw}: time values
te_1, te_2, ..te_{nptt} : temperature curve values

Example:

⁕THERM
NPTT=3 TI=0., 1., 2. TE=100., 200., 150. %



☞ **Note:** For the thermomechanical load $t_{nptw} \equiv t_{nptt}$, and both curves must have $t_1 \equiv 0$. But the number and time value of the data points in-between maybe different, see figure 7.

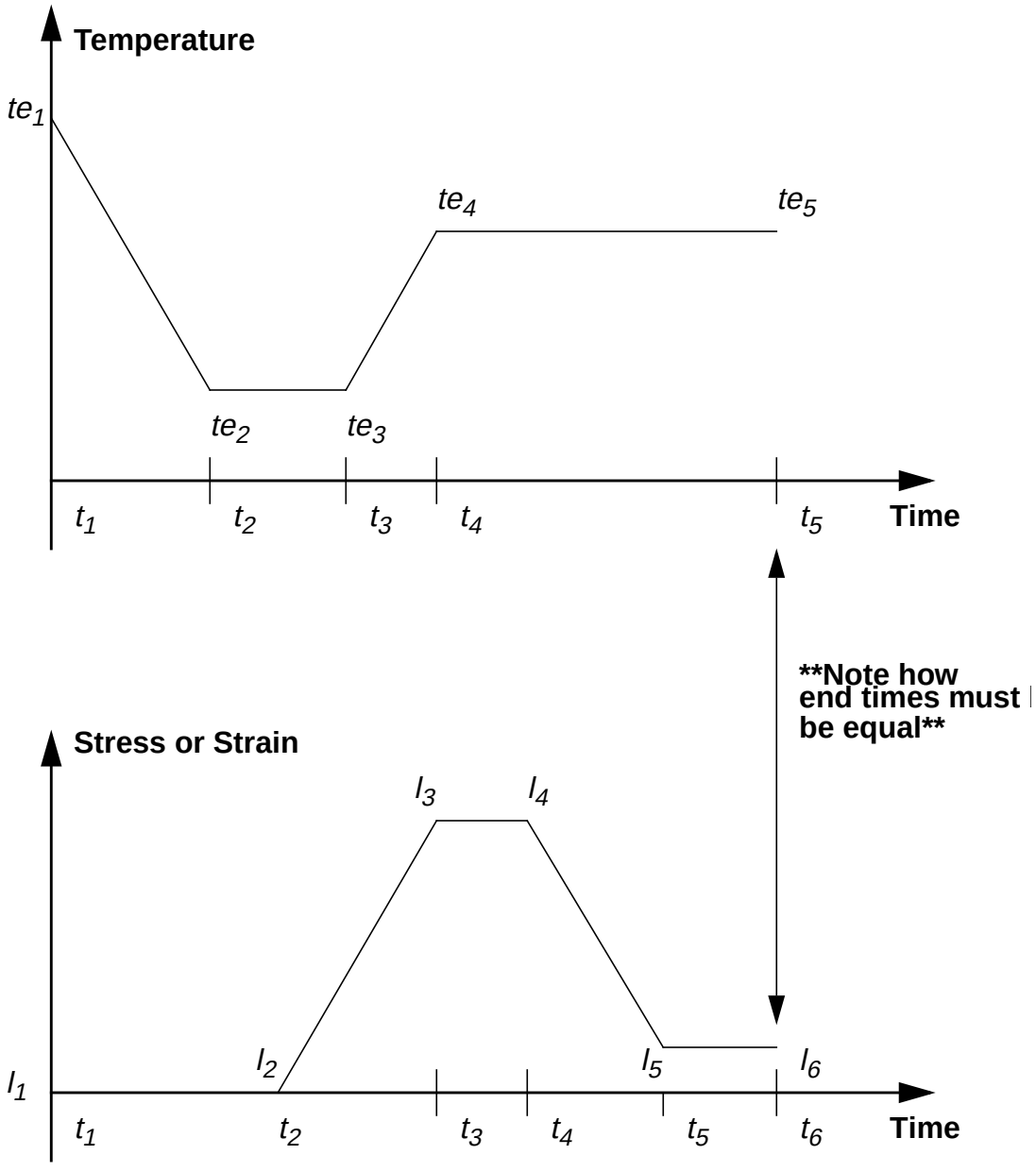


Figure 7: Load History Specification